

Remarks

The above Amendments and the following Remarks are in reply to the Office Action mailed October 24, 2003. The fee for additional new claims and one month extension of time is included herewith.

Claims 1-70 were pending in the Application prior to the outstanding Office Action. Within the Office Action, Claims 1-70 were rejected, and Claims 16-17, 23-54 and 66 were objected to. In addition, Figures 11A-11D were objected to within the Office Action. The Applicants have amended Figures 3A, 3D and 3E and have provided new formal drawings of Figures 3A, 3D and 3E. The Applicants have also amended Claims 6-7, 14-23, 26-64, 66, 68-69 and added new Claims 71-73. Therefore, Claims 1-73 are currently pending. Reconsideration of the Application is respectfully requested.

I NON-CONSIDERATION OF INFORMATION DISCLOSURE STATEMENT

The Applicants submitted an Information Disclosure Statement along with the appropriate fee on June 6, 2002. The Information Disclosure Statement submitted on June 6, 2002 contained 45 references. On October 8, 2002, the Applicants had filed a Supplemental Informational Disclosure Statement along with the appropriate fee, whereby the Supplemental Information Disclosure Statement included 111 references. Within the Office Action, only the Information Disclosure Statement filed on June 6, 2002 was considered, and the Supplemental Information Disclosure Statement filed on October 8, 2002 was not considered. Therefore, the Applicants respectfully request that the Supplemental Information Disclosure Statement filed on October 8, 2002 be considered. The Applicants have provided a copy of the Supplemental Information Disclosure Statement, as filed on October 8, 2002, in Appendix II for convenience purposes.

II OBJECTION TO DRAWINGS

Within the Office Action, the Figures 11A-D were objected to for failing to comply with 37 C.F.R. 1.84 (p)(5). Within the Office Action, it was stated that Figures 11A-D do not include the

reference signs 252, 254, 256 which are mentioned in the description on pages 35-38. The Applicants respectfully disagree.

The Applicants filed a Preliminary Amendment on June 5, 2002 which included a Substitute Specification. Within the Preliminary Amendment and Substitute Specification, the Applicants had included a discussion relating to Figures 13A-13C. In particular, on pages 55-57 of the present application, the reference numbers 252, 254, 256 are discussed in detail in relation to Figures 13A-13C. Accordingly, from the Preliminary Amendment and Substitute Specification, all reference to reference numerals 252, 254, 256 therefore refer to Figures 13A-13C instead of Figures 11A-11D. However, as stated in the present specification, the electrodes 252, 254, and 256, which are shown in Figures 13A-13C, are alternatively incorporated into any of the electrodes assembly configurations discussed in the application including the electrode assembly shown in Figures 11A-11D. The Applicants have therefore not amended Figures 11A-11D to describe the electrodes 252, 254, and 256, since the specification refers to electrodes 252, 254, 256 shown in Figures 13A-13C.

The Applicants have amended Figures 1B, 1C, 3A, 3D, 3E and 4B to correct minor typographical errors. The present specification refers to the intake vent as reference numeral 204a, which is on the top surface of the housing, and the intake vent 204b on the bottom surface of the housing 200. However, originally filed Figures 3A, 3D, and 3E show the bottom intake to be reference numeral 204a. The Applicants have therefore amended reference numeral 204a shown on the bottom surface of the housing 200 to now be 204b in Figures 3A, 3D and 3E. In addition, the Applicants have amended Figures 1B and 1C to change reference numeral 20 to reference numeral 70 as well reference numeral 30 to reference numeral 90 to conform to the specification. In addition, in Figure 4B, the Applicants have deleted reference numeral 218 which is shown twice in the figure. The Applicants submit that the drawings are acceptable and request consideration thereof.

III OBJECTIONS TO CLAIMS

Within the Office Action, Claims 16, 17, 23-54 and 66 were objected to for having various informalities and technical errors. The Applicants have amended Claims 16, 23, 27, 37, 46 and 66 to

correct these typographical errors. It should be noted that the amendments made to Claims 16, 23, 27, 37, 46 and 66 were merely informal and cosmetic and do not affect the scope of the claims in the present invention. The Applicants submit that Claims 16-17, 23-54 and 66 overcome the objection and respectfully request reconsideration of Claims 16-17, 23-54 and 66.

IV REJECTIONS TO CLAIMS UNDER 35 U.S.C. 112.

Within the Office Action, Claims 45-64 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. The Applicants have amended Claim 45 to recite that the housing has at least one side surface. The Applicants have also amended Claim 48 to recite “wherein said outlet includes first and second outlets, and said side surface of said housing has substantially opposed first and second side surfaces with one of the said first and second outlets located on respective substantially opposed first and second side surfaces....” From the amendment, independent Claim 45 recites that the housing has at least one side surface. The housing in amended dependent Claim 48 has two substantially opposed side surfaces which have the first and second outlets thereon. The Applicants submit that amendments therefore resolve the conflict between the limitations in Claims 45 and 48.

Claims 46-54 are dependent upon the independent Claim 45. As stated above, Claim 45 is definite and allowable. Accordingly, Claims 46-54 are also allowable as being dependent upon an allowable base claim.

In addition, the Applicants have amended independent Claim 55 to recite an air transporter-conditioner comprising: a housing with a top and a bottom; said housing having a first inlet located in said top and a second inlet located in said bottom; said side housing including first and second side surfaces located between the top and the bottom and said housing further including a first outlet located in said first side surface and a second outlet located in said second opposed side surface; and an ion generator located in said housing that, when energized, creates a flow of air from said inlets to said outlets. Amended Claim 55 clarifies that the side of the housing has at least one side between the top

and bottom, whereby the first outlet is located on a first opposed side and the second outlet is located on a second opposed side. For at least these reasons, the Claim 55 is definite and is in a condition for allowance.

Claims 56-64 are dependent upon the independent Claim 55. As stated above, Claim 55 is definite and allowable. Accordingly, Claims 56-64 are also allowable as being dependent upon an allowable base claim. Accordingly, the Applicants respectfully submit that Claims 45-64 overcome the rejection under 35 U.S.C. 112 second paragraph and are in a condition for allowance.

V CLAIMS REJECTED UNDER 35 U.S.C. 103.

Satyapal

Within the Office Action, Claims 1-5, 8, 10, 14, 17-27, 29, 31, 35, 39-48, 51-59, 61-62, and 65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 5,879,435 to Satyapal, et al. (hereinafter “Satyapal”). In particular, it is stated within the Office Action that although Satyapal does not teach a plurality of the air inlets or the air outlets or the ion generators, it would have been within the skill of one in the art to duplicate the parts. It is stated within the Office Action that, therefore, the plurality of air inlets, air outlets or ion generators have no patentable significance. In addition, it is stated within the Office Action that although Satyapal does not teach that the inlets and the outlets are respectively located on opposing surfaces of the housing or does not teach the location of the electrodes and the ion generators with respect to the inlets and the outlets, it would have been obvious to one skilled in the art at the time that the invention was made that the location of the structures would have been an obvious matter of design choice. It is also stated that multiple air inlets, air outlets, and electrodes would work equally well as taught by Satyapal, and the Applicants have not disclosed advantages of these particular locations of the inlets, the outlets, and the electrodes over other locations. Further, it is also stated within the Office Action that Satyapal teaches that the inlet and outlet cover substantially all sides of the housing. The Applicants respectively disagree.

The present invention at issue is directed to a dual inlet and dual outlet electrostatic air transporter-conditioner. The present device is preferably a compact, stand-alone consumer unit which

includes a housing 210 with two intake areas, 204a and 204b as shown in amended Figures 3A-3E. In addition, as shown in amended Figures 3A-3E, the unit 200 includes two exit areas 206a and 206b. The unit of the present invention also preferably accommodates two ion generating units which allow more particles to be removed from the airflow than the device in Satyapal with no substantial increase in voltage in the unit. The present unit preferably includes a UV lamp 290 located upstream of the negative ion emitter as shown in Figures 14A-C. The UV lamp thus kills microbes which enter the unit through the two inlet vents before the microbes are pushed downstream toward the collector electrodes and the exit outlets.

As shown in Figure 3A of the present application, air is preferably brought into the center of the housing 210 via the inlet vents 204a and 204b with the two electrode assemblies 220 and is driven downstream toward the outlet vents 206a and 206b. The inlet vents 204a and 204b are located upstream of each of the two electrode assemblies 220, so that air travels the shortest path possible between each respective inlet and outlet. The outlet vents 206a, 206b are preferably located directly downstream of each ion generator so that the airflow created by each electrode assembly 220 may have a separate exit out of the housing 210. The outlet vents are preferably located in the side peripheral wall of the housing between the top and the bottom surfaces of the housing. The two inlet vents 204a and 204b are configured on the top and the bottom surfaces respectively of the housing. The two inlet vents 204a, and 204b and outlet vents 206a, 206b thus allow a greater volume of air to enter the unit than a unit having only one inlet vent.

Although air passing through the housing of the present invention could be conditioned by a single electrode assembly, as in Satyapal, a single electrode assembly in the present invention will not efficiently condition or clean the increased volume of air brought into the housing through the multiple inlet vents 204a, 204b. Accordingly, the housing 210 contains two electrode assemblies 220 to efficiently condition and increase airflow by directing air coming in through the top and bottom out through the sides of the housing.

As stated in the present specification, the volume of air entering the unit at a particular time is proportional to the area of the inlet of the housing. The volumetric air rate of the unit in Satyapal is

constrained by the area of a single inlet 22. In contrast, the multiple inlets 204, 206 of the present invention allows more volume of air to enter the housing at a particular time, which is a significant advantage. As stated in the present specification, if the airflow velocity is similar between the present invention and a single inlet unit, the present invention will draw in more air, because air is brought in through the top as well as the bottom inlet vents instead of through one inlet. This is another significant advantage since more air travels through the housing 210 at a particular time, and particles are brought into the housing 210 and collected by the electrode assemblies 220 in a quicker fashion than a unit having a single inlet and outlet as shown in Satyapal. In addition, since more air is pulled into the unit using the dual inlets, as opposed to single inlet devices, less energy is needed to move the same amount of air through the present invention. Therefore, a significant savings in energy is realized and contemplated in the present invention. Further, less energy utilized by the present invention translates to less ions needed to be produced by the device. As a result, the present device produces less ozone than a single inlet/outlet device for moving the same amount of air.

Satyapal describes an electronic air cleaner 10 having a housing 20 consisting of one airstream inlet 22, one airstream outlet 24 and an airflow passageway 25 extending therebetween. The cleaner is designed to be installed in a central air cooling and heating system, such as an air duct, whereby air enters the air cleaner 10 through the inlet 22 and traverses the airflow passageway 25 whereby the air exits the air cleaner 10 through the outlet. The electrostatic participator cell 40 in Satyapal consists of a plurality of ionizer wires 46 and a plurality alternately charged collector plates 42 axially aligned with the airflow passageway 25. The germicidal lamp 50 emits an ultraviolet light and is disposed downstream of the electrostatic participator cell 40 and upstream of any additional devices. The lamp 50 is positioned downstream to not be exposed to the higher particulate loadings in the flow upstream as well as to not interfere with and distort the distribution of airflow entering the electrostatic participator cell 40.

In contrast to the present invention, and as recognized within the Office Action, the Satyapal device does not include dual inputs and dual outputs as well as multiple sets of ion generators which drive the air from the multiple inlets to their respective outlets. Instead, Satyapal only describes a

device which fits within an air duct, whereby the device has one inlet and one outlet which are on opposite ends of the housing. This configuration forces air traveling through the air duct to flow completely through the housing from the inlet to the outlet. In particular, as shown in the figures in Satyapal, the inlet vent is shown on the right side of the housing 20, and the outlet vent is shown on the left side of the housing 20. In addition, the device in Satyapal utilizes only one electro-precipitator cell which directs air from the inlet to the outlet. There is no hint, teaching or suggestion that the housing 20 has any additional vents on the top or bottom surfaces in the figures nor on the surface of the device which is oriented coming out of the page. In other words, contrary to the Office Action, there is no teaching in Satyapal that the inlet and outlet covers substantially all of the sides of the housing. Thus, Satyapal teaches away from multiple inlets and outlets on other sides of the device, because the Satyapal device is configured to be used in an air duct of a central air cooling and heating system, wherein one inlet and one outlet is sufficient for operation of the device.

As stated above, the advantages within the present invention of having dual inlets and dual outlets is that more volume of air passes through the unit at a particular time, compared to a single inlet/outlet device. Also, using only one ion generator in the present invention would cause the present device to direct the air from both inlets through only one outlet due to the corona wave produced between the negative ion emitter and the positive ion emitter. This would hinder the use of multiple outlets. Thus, the present invention preferably utilizes two ion generating units to effectively displace the increased amount of air through the multiple outlets. There is no motivation to have two electro-precipitator cells in the Satyapal device, because there is only one inlet and outlet. In fact, the presence of only one electro-precipitator cell in the Satyapal device further supports that the Satyapal device does not support multiple inlets and outlets. In addition, Satyapal does not disclose other areas in the housing where additional inlet and outlets could be located in relation to the electrostatic precipitator cell 40, such that the precipitator cell 40 would be able to effectively drive air from the additional inlets to the additional outlets. Furthermore, Satyapal provides no teaching where the germicidal lamp 50 would be positioned in light of additional inlets, outlets and/or electro-precipitator cells. Satyapal expressly teaches that the object of the Satyapal device is to kill microbes using the UV lamps which

are collected on the collector electrodes, which supports the reason why the UV lamps are positioned downstream of the collector electrodes. Therefore, one skilled in the art would have no motivation, upon reviewing Satyapal, to modify Satyapal to have dual inlets, dual outlets and dual ion generators. To assert that one skilled in the art would have the motivation to modify Satyapal to reach the present invention would be impermissible hindsight. For at least reasons, the present invention is not obvious in light of Satyapal, individually or in combination with other references.

Regarding Claim 1, for at least the reasons stated above, there is no hint, teaching or suggestion in Satyapal to modify the air cleaner to have multiple inlets, multiple outlets and multiple ion generators which direct air from multiple inlets to an outlet. Accordingly, Claim 1 is patentable over Satyapal individually or in combination.

Claims 2-5, 8, 10, 14, and 17-22 are dependent upon the independent Claim 1. As stated above, Claim 1 is allowable over the teachings of Satyapal. Accordingly, Claims 2-5, 8, 10, 14, and 17-22 are also allowable as being dependent upon an allowable base claim.

Regarding amended Claim 23, as stated above, there is no hint, teaching or suggestion in Satyapal to modify the air cleaner to have multiple outlets configured non-parallel to the multiple outlets. Therefore, one skilled in the art would have no motivation to modify the air cleaner in Satyapal to reach the present invention in amended Claim 23. Accordingly, amended Claim 23 is patentable over Satyapal individually or in combination.

Claims 24-27, 29, 31, 35, and 39-44 are dependent upon the independent Claim 23. As stated above, amended Claim 23 is allowable over the teachings of Satyapal. Accordingly, Claims 24-27, 29, 31, 35, and 39-44 are also allowable as being dependent upon an allowable base claim.

Regarding amended Claims 45 and 55, as stated above, there is no hint, teaching or suggestion in Satyapal to modify the structure of the air cleaner to have multiple inlets in the top and bottom surfaces and one or more outlets in the side surface or surfaces. For at least these reasons, amended Claims 45 and 55 are patentable over Satyapal individually or in combination.

Claims 46-48 and 51-54 are dependent upon the independent Claim 45. In addition, Claims 56-59, 61 and 62 are dependent upon the independent Claim 55. As stated above, amended Claims

45 and 55 are allowable over the teachings of Satyapal. Accordingly, Claims 46-48, 51-54, 56-59, 61 and 62 are also allowable as being dependent upon allowable base claims.

Regarding Claim 65, Satyapal does not teach a conditioner having at least two inlets and outlets as well as a first and second electrode assembly, each of which have two “U”shape electrodes located adjacent to the respective outlets. In addition, there is no hint, teaching or suggestion in Satyapal to modify the Satyapal device to have multiple inlets, outlets and electrode assemblies. For at least these reasons, one skilled in the art would have no motivation to modify the air-cleaner in Satyapal to reach the present invention in Claim 65. Accordingly, Claim 65 is patentable over Satyapal individually or in combination with other references.

Satyapal in view of Moon

Within the Office Action, Claims 6, 11-13, 28, 32-34, and 66-70 have also been rejected within the Office Action under 35 U.S.C. 103(a) as being unpatentable over Satyapal and in view of U.S. Patent No. 5,215,558 to Moon. In particular, the Office Action states that it would have been obvious to one skilled in the art at the time that the invention was made to have included the focus and trailing the electrodes, as taught by Moon, into the apparatus of Satyapal to reach the present invention. The Applicants respectfully disagree.

Claims 6, and 11-13 are dependent upon the independent Claim 1. Claims 28 and 32-34 are dependent on the independent Claim 23. Also, Claims 61 and 62 are dependent on the independent Claim 55. As stated above, Claims 1, 23 and 55 are allowable over the teachings of Satyapal. Accordingly, Claims 6, 11-13, 28 and 32-34 are also allowable as being dependent upon allowable base claims.

Regarding Claim 67, as stated above, there is no hint, teaching or suggestion in Satyapal to modify the conditioner to have at least two inlets opposed from each other, at least two outlets opposed from each other, and multiple ion generators. In addition, there is also no hint, teach or suggestion in Satyapal that the germicidal lamp is positioned such that the lamp is not visible to an individual looking into an inlet or an outlet. Furthermore, Satyapal does not teach a shell which directs germicidal light

away from the inlets, outlets and ion generators. For at least these reasons, one skilled in the art would have no motivation to modify the air-cleaner in Satyapal with Moon to reach the invention claimed in Claim 67. Accordingly, Claim 67 is patentable over Satyapal and Moon, individually or in combination.

Claim 68 is dependent upon the independent Claim 67. As stated above, Claim 67 is allowable over the teachings of Satyapal and Moon, individually or in combination. Accordingly, Claim 68 is also allowable as being dependent upon an allowable base claim.

Regarding Claims 69 and 70, as stated above, there is no hint, teaching or suggestion in Satyapal to modify the air cleaner to have multiple inlets and multiple outlets. In addition, for the reasons stated above, there is no hint, teaching or suggestion to modify the Satyapal device to have multiple electrode assemblies, as in Claim 69, or the multiple ion generators, as in Claim 70. For at least these reasons, one skilled in the art would have no motivation to modify the air-cleaner in Satyapal with Moon to reach the inventions claimed in Claims 69 and 70. Accordingly, Claims 69 and 70 are patentable over Satyapal and Moon, individually or in combination.

Satyapal in view of Anzai

Within the Office Action, Claim 7, 15, 16, 36-38, 49, 50, 60, 63 and 64 were rejected under 35 U.S.C. 103(a) as being unpatentable over Satyapal in view of U.S. Patent No. 4,772,297 to Anzai. The Applicants respectfully traverse.

Claims 7, 15 and 16 are dependent upon the independent Claim 1. As stated above, Claim 1 is allowable over the teaching of Satyapal and Anzai, individually or in combination. Accordingly, Claims 7, 15 and 16 are also allowable as being dependent upon an allowable base claim.

Claims 36-38 are dependent upon the independent Claim 23. As stated above, Claim 23 is allowable over the teachings of Satyapal and Anzai individually or in combination. Accordingly, Claims 36-38 are also allowable as being dependent upon an allowable base claim.

Claims 49 and 50 are dependent upon the independent Claim 45. As stated above, Claim 45 is allowable over the teachings of Satyapal and Anzai individually or in combination. Accordingly, Claims 49 and 50 are also allowable as being dependent upon an allowable base claim.

Claims 60, 63 and 64 are dependent upon the independent Claim 55. As stated above, Claim 55 is allowable over the teachings of Satyapal and Anzai individually or in combination. Accordingly, Claims 60, 63 and 64 are also allowable as being dependent upon an allowable base claim.

For at least these reasons, Claims 7, 15, 16, 36-38, 49, 50, 60, 63 and 64 are allowable over Satyapal and Anzai, individually or in combination.

VI NEW CLAIMS

The Applicants have added new independent Claims 71-73. The Applicants respectfully submit that new Claims 71-73 are patentable over the prior art.



CONCLUSION

In light of the above, it is respectfully submitted that Claims 1-73 in the subject patent application are allowable, and a Notice of Allowance is respectfully requested. The Examiner is respectfully requested to telephone the undersigned to assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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